

**The family Triphoridae (Mollusca, Gastropoda) in Cuba. 5.  
The genera *Marshallora*, *Mesophora*, *Similiphora*, *Eutriphora*,  
*Latitriphora*, *Aclophora* and other species without generic affiliation**

Emilio ROLÁN

Museo Galego do Mar, Cánovas del Castillo 22, 36202 Vigo, Spain

Raul FERNÁNDEZ-GARCÉS

Calle 41, nº 6607, 55100 Cienfuegos, Cuba

KEYWORDS: Triphoridae, Caribbean Sea, Cuba.

PALABRAS CLAVE: Triphoridae, Mar Caribe, Cuba.

ABSTRACT. Twelve species of the family Triphoridae are described within the genera *Marshallora* (2), *Mesophora* (2), *Similiphora* (1), *Eutriphora* (1), *Latitriphora* (1), *Aclophora* (1), and *Triphora* s.l. (4). New information is given for species that are already known. The protoconchs of all of them are figured. Three species new to science are described: *Aclophora sagei* n. sp., "*Triphora*" *osclausum* n. sp. and "*Triphora*" *martii* n. sp.

RESUMEN. Se describen 12 especies de la familia Triphoridae, pertenecientes a los géneros *Marshallora* (2), *Mesophora* (2), *Similiphora* (1), *Eutriphora* (1), *Latitriphora* (1), *Aclophora* (1), and *Triphora* s.l. (4), realizando nuevas aportaciones a las especies ya conocidas y representando las protoconchas de todas ellas. Tres nuevas especies para la ciencia son descritas: *Aclophora sagei* n. sp., "*Triphora*" *osclausum* n. sp. y "*Triphora*" *martii* n. sp.

## INTRODUCTION

The present study is the latest in a series of publications that have reviewed the family Triphoridae in Cuba. Genera already studied include *Metaxia* Monterosato, 1884 (ROLÁN & FERNÁNDEZ-GARCÉS, 1993a), *Iniforis* Jousseume, 1884 (ROLÁN & FERNÁNDEZ-GARCÉS, 1993b), *Isotriphora* (ROLÁN & ESPINOSA, 1994) and *Monophorus*, *Nototriphora*, *Cosmotriphora* and *Cheirodonta* (ROLÁN & FERNÁNDEZ-GARCÉS, 1994).

Prior to our revision, there were few published references to the Triphoridae of Cuba. Four species were mentioned by PILSBRY & AGUAYO (1933), and one of these was among the five species discussed by GARCIA & LUQUE (1986).

In the present work we describe and redescribe 12 species. The protoconchs of most of these species are figured and described for the first time, and the differences between related species are illustrated by features of the protoconch and teleoconch. Generic classification has in most cases been based on

examination of the radula as well as on characteristics of the shell.

Studied material includes "specimens", referring to live-collected animal, and "shells", which have been collected empty.

**Abbreviations** used: AMNH: American Museum of Natural History, New York; BMNH: The Natural History Museum, London; IES: Instituto de Ecología y Sistemática, La Habana; MCZ: Museum of Comparative Zoology, Cambridge; MNCN: Museo Nacional de Historia Natural, Madrid; ZMA: Zoölogisch Museum, Amsterdam.

## SYSTEMATICS

Suborder PTENOGLOSSA Gray, 1853  
 Superfamily TRIPHOROIDEA Gray, 1847  
 Family TRIPHORIDAE Gray, 1847

Genus *Marshallora* Bouchet, 1984

Type species (original designation): *Murex adversus* Montagu, 1803; Recent, Mediterranean.

*Marshallora modesta* (C. B. Adams, 1850)  
 Figs. 1, 2, 3, 4

*Cerithium modestum* C. B. Adams, 1850. Contribution to Conchology, 7: 117. Lectotype selected by Clench & Turner (1950, pl. 39, fig. 8).

*Triphora nigrocincta*. WARMKE & ABBOTT, 1961 (non C. B. Adams). Caribbean seashells, pl. 13, fig. k.

**Material studied.** Jamaica: Lectotype MCZ 186180. Southern Cuba: 20 specimens from less than 1 m depth, under rocks with sponges, and 10 shells from sediment at 10-20 m, Cienfuegos Bay.

**Description.** Shell (Figs. 1 & 2): see ADAMS (1850) and CLENCH & TURNER (1950). Originally described as "reddish black...with, on the upper whorls, two, and in the middle and lower whorls three spiral ridges, which are of equal size on the lower two-thirds of the shell." The number of whorls (including the protoconch) is usually 12-13, increasing to 14 in some shells, and ADAMS (1850) described "...whorls about fourteen,...". The following details complete the description:

Protoconch (Fig. 3) with about 4 whorls, nucleus with minute hemispheric granules, subsequent whorls with two spiral ridges crossed by numerous axial riblets.

Teleoconch at first with two spiral cords, the upper one being less pronounced on first whorl. A third cord appears in the middle of the space between the other two on the fifth or sixth whorl. Aperture pyriform, siphonal canal open and short; anal sinus is shallow.

Animal white, slightly translucent, with small white spots on foot and head. Tentacles elongate, narrow.

Operculum corneus, multispiral, yellowish, translucent.

Radula with formula 6-1-1-1-6 (Figs. 4 & 43); central tooth with 6 cusps on each side separated by a narrow space. Lateral teeth similar to central tooth, with only 5 cusps on

each side. Marginal teeth very fine, elongated, curved.

**Remarks.** Shells from the studied material (Figs. 1 & 2) closely resemble the lectotype figured by CLENCH & TURNER (1950). It is important to consider the new information in addition to the original description of *Marshallora modesta*, for as shown below, several superficially similar species have been confused with it.

*Marshallora cf. nigrocincta*  
 (C. B. Adams, 1839)  
 Figs. 5, 6, 7

*Cerithium nigrocinctum* C. B. Adams, 1839. Boston Journal of Natural History 2: 286-287, pl. 4, fig. 11. Lectotype designated by CLENCH & TURNER (1950, pl. 38, fig. 11).

**Material studied.** Northern Cuba: 3 shells at 4 m, Comodoro, La Habana; 3 shells at 4 m, Jibacoa; 2 shells at 5 m, Baracoa. Southern Cuba: 2 shells at 2 m, Playa Girón; 3 shells at 2 m, Hotel Colony Bay, Isla de la Juventud; 12 shells between 10-25 m, Cienfuegos Bay. Bahamas: 1 shell from beach drift on Elbow Cay and 1 shell from Treasure Cove, Abaco I.

**Description.** Shell (Figs. 5 & 6): see CLENCH & TURNER (1950). Originally described as "blackish red, conic-cylindrical, with three revolving series of granules; the middle series.....on the whorls of the lower half....of equal size, but diminishing above, and wanting on the upper fifth; the upper row is less than the lower one ....and is wanting upon several of the first whorls".

Protoconch (Fig. 7) with a nucleus with minute granules, followed by a whorl with the same sculpture which subsequently develops into fine axial ribs; these ribs at first crossed by one spiral ridge, a second adapical ridge appears later. Ribs rectilinear on first whorl, then sigmoidal.

**Remarks.** The shells in our material (Figs. 5 & 6) vary slightly in size, but the larger ones correspond well with the original description and with the size mentioned by the author. On most of them we noticed that the sutural depression and the area below the upper spiral cord are darker, unlike the nodules, which are grey. The protoconch of *Triphora nigrocincta* was already been figured by THIRIOT-QUIEVREUX & SCHELTEMA (1982, figs. 1E & 1F) from an area close to the type locality. Our material has a very similar protoconch (Fig. 7).

The radula of the present Caribbean populations was figured by BANDEL (1984, fig. 86, pl. 5, figs. 2-3) and it is similar but not exactly equal to the Massachusetts *M. nigrocincta* shown by BOUCHET (1984, fig. 17).

The present species was placed in the genus *Marshallora* by BOUCHET (1984) based on its radula which is similar to that of *M. modesta*. It seems doubtful that this Caribbean species could be conspecific with *M. nigrocincta*, which was described from northern, cold waters (Massachusetts), and it was thought that an undescribed species might be represented. However, from the description, and the lectotype (MCZ 186157) examined, and protoconch of true *M. nigrocincta* (as figured by THIRIOT-QUIEVREUX & SCHELTEMA, 1982), we could find no important differences. Thus, if the species here studied is not *M. nigrocincta*, it could only be proved by comparison of soft parts from the type locality with live-collected material from the Caribbean.

#### Genus *Mesophora* Laseron, 1958

Type species (original designation): *Mesophora bowenensis* Laseron, 1958 (= *Triforis fusca* Dunker, 1860); Recent, Western Pacific.

#### *Mesophora novem* (Nowell-Usticke, 1969) Figs. 8, 9, 10, 11

*Triphora novem* Nowell-Usticke, 1969. A supplementary list of new shells of St. Croix, p. 12, pl. 2, fig. 20.

*Triphora novem*. Nowell-Usticke, 1971. A supplementary listing of new shells (illustrated) to be added to the check list of the marine shells of St. Croix, p. 8, pl. 2, fig. 403.

**Material studied.** Virgin Islands.: 1 fragment (holotype, in AMNH 195419), St. Croix. Southern Cuba: 3 shells at 25-56 m, Cienfuegos Bay; 1 shell at 20 m, Cayo Matías.

**Description.** Shell (Figs. 8, 9 & 10), see NOWELL-USTICKE (1971). The original description is short but includes the following important details: "... 3 or 4 white beaded whorls, the remaining straight sided whorls are brown beaded, the upper whorls having two nodulous spirals, the lower whorls with three." The holotype (Fig. 8) is a broken shell. Study of our shells (Fig. 9 & 10) provides the following additional information for this species:

Protoconch (Fig. 11) with 3 1/2-4 whorls, apex covered by crowded hemispherical tubercles; subsequent with whorls axial ribs crossed by two spiral cords. Teleoconch of 6-11

whorls, initial spiral sculpture of two cords increasing to three near last adult whorl. Spiral cords with nodules that appear to be cut off at the level of the cord, especially the lower one. Between these two cords the tubercles are well separated, and are joined by oblique ribs. Last adult whorl with six spiral cords, the lower one lacking nodules, close to the siphonal canal. Siphonal canal, elongate curving towards dorsum, fully tubular besides aperture. Protoconch brown, followed by first 3 or 4 white whorls of the teleoconch. Elsewhere light brown, tinted with violet at suture and on the upper spiral cord, tubercles lighter, space between upper and lower cords whitish cream, base brown.

**Remarks.** The description of *Mesophora novem* was based on the holotype, which consists of an incomplete teleoconch, lacking the protoconch and the final adult whorls. Nevertheless, comparison of our shells (Figs. 9 & 10) with the type showed them to be identical in colour, size, and sculpture. Taking into account the above redescription, the characteristics of the species are well defined. The generic assignment is made on the basis of similarity of the following species.

#### *Mesophora aff. novem* (Nowell-Usticke, 1969) Figs. 12, 13, 14, 15, 16

**Material studied.** Northern Cuba: 1 specimen at 2 m, Marianao Beach, La Habana. Southern Cuba: 1 shell at 20 m, Cayo Avalos; 4 shells at 25 m, Punta Tamarindo, and 11 shells and 1 specimen, Cienfuegos Bay.

**Description.** Shell (Fig. 12, 13 & 14) sinistral, ovoid elongated, pointed and light brown.

Protoconch (Fig. 16) with about 4 1/2 whorls. First whorl with crowded dense hemispherical granules; this sculpture later develops into axial ribs crossed by two spiral cords, the upper one being attenuated in the beginning and fading out in the middle of the last whorl.

Teleoconch with two nodulous spiral cords on early whorls. A third spiral cord forms two or three whorls before the body whorl; it is located closer to the upper cord and is initially very small, enlarging slowly until the three cords are of equal size on the body whorl. Brown on the lower part of the teleoconch is darker at the suture, with similar color extending to the edges of the upper and lower nodulous cords; the nodules themselves are of a

lighter steely color. The spaces between these spiral cords are paler, orange on beached shells. Siphonal canal short and curved full enclosed beside the aperture.

Animal cream coloured with irregular yellowish markings. Tentacles elongated. Eyes are in the base of the tentacles, with a small external prominence.

Operculum subcircular, nucleus central.

Radula (Figs. 15 & 44), with formula 12-1-1-1-12, and central tooth with three cusps, lateral teeth with four cusps, marginal teeth with three cusps of similar size.

**Remarks.** The generic classification is based on a combination of the radular features and the characteristic shell. The two spiral cords on the upper part of the teleoconch have nodules that are slightly flattened adapically, and are thus similar to those of *Mesophora granosa* (Pease, 1870) and *M. negrita* (Laseron, 1958), as figured by MARSHALL (1983).

The shell is superficially similar to that of *M. novem*, which, however, is a lighter, cream-violet color, with the lower spiral cord cream instead of brown. In *M. novem* the medial spiral cord does not appear until shortly before the body whorl, the axial ribs are more obliqued, and, the siphonal canal is a little longer. Comparison of the protoconchs shows an apparent difference in size of the apical tubercles (see Figs. 11 & 16), and on this species the upper spiral cord almost disappears on the first or second whorl of the protoconch. However, these observations are based on a limited amount of material, and it is uncertain whether this represents an ecological form or an undescribed species. We prefer not to give it a new name until more material can be examined.

### Genus *Similiphora* Bouchet, 1984

Type species (original designation): *Triphora similior* Bouchet & Guillemot, 1978; Recent, Mediterranean and East Atlantic.

#### *Similiphora intermedia*

(C. B. Adams, 1850)

Figs. 17, 18, 19

*Cerithium intermedium* C. B. Adams, 1850. Contribution to Conchology, 7, p. 119. Lecto-type designated in Clench & Turner (1950, pl. 38, fig. 9).

*Triphora pulchella* (C. B. Adams, 1850) in Abbott, 1974. American seashells, p. 111, fig. 1135.

**Material studied.** Northern Cuba: 1 specimen and 4 shells from Marianao Beach. Southern Cuba: 15 shells in sediment from 56 m deep, Faro de Los Colorados and 20 shells in 10-20 m, Cienfuegos Bay; 2 specimens and 4 shells at 15 m, Punta Pedernales, Isla de la Juventud.

**Description.** Shell (Figs. 17 & 18), see ADAMS (1850) and CLENCH & TURNER (1950). The shell varies in length from 2.8 mm (with 6 teleoconch whorls) to 7.8 mm (with 11 whorls). The following additional features should be noted: The color is constant in the lower spiral cord (white) and on the upper (dark or light brown). Median spiral cord whitish, cream and brown, usually remaining lighter than the upper cord.

Protoconch (Fig. 19) with 5 1/2 whorls, first whorl covered by hemispheric tubercles. Second whorl with axial threads crossed in the lower half by a spiral thread. A second spiral thread appears on subsequent whorls, reverting to a single cord on last whorl.

Animal with the head and anterior part of the foot blackish. Tentacles translucent white with black spots. The eyes at the base of the tentacles, with a nearby swelling.

**Remarks.** The description is clear and at present there seems to be no doubt on the identity of this species. DE JONG & COOMANS (1988) mention the confusion of some authors as to the name assigned to this species.

NOWELL-USTICKE (1971) mentions figure 9 in the plate 38 of CLENCH & TURNER (1950) as not matching the original description and he considers it to be *T. novem*. We do not agree with this opinion because that specimen shows three equal spiral cords on the fourth-fifth whorl of the teleoconch which does not occur on *T. novem* (see Figs. 8-10).

Other Caribbean banded triphorids in which the upper spiral cord is brown are *Monophorus ateralbus* Rolán & Fernández-Garcés, 1994, which is smaller and pyriform with larger nodules; *Isotriphora taenialba* Rolán & Espinosa, 1994 which has the colour cream instead of white, with a large and white, paucispiral protoconch. "*Triphora*" *elvirae* De Jong & Coomans, 1988, "*T.*" *ellyae* De Jong & Coomans, 1988 and *Eutriphora bermudensis* (Bartsch, 1911) are also spirally banded but the upper spiral cord in these species is white.

*"Triphora" elvirae*

De Jong &amp; Coomans, 1988

Figs. 20, 21, 22

*Triphora elvirae* De Jong & Coomans, 1988. Marine gastropods from Curaçao, Aruba and Bonaire, p. 50, pl. 34, fig. 240.

**Material studied.** Curaçao: Holotype, in the ZMA (n° 3.87.071). Southern Cuba: 3 shells at 20 m, Cienfuegos Bay.

**Description.** Shell (Figs 20 & 21). Additions to that of DE JONG & COOMANS (1988):

Protoconch (Fig. 22), present on only one of our shells, of 4 whorls, first whorl with minute hemispherical granules arranged in rows at apex and above suture. One spiral thread on next whorl. A second adapical spiral thread is faintly visible on the second and third whorls, being two threads of equal strength on the last whorl.

**Remarks.** Our shells (Fig. 21) are very similar to the holotype (Fig. 20) but this has light brown color that extends further from the spiral brown nodules.

The generic position of the present species is uncertain as the animal and radula have not yet been seen.

Compared with other Caribbean triphorids in which the upper spiral cord of the teleoconch is white *Iniforis turrithomae* (Holten, 1802) and *I. pseudothomae* Rolán & Fernández-Garcés, 1993, both have a tubular anal hole located far from the aperture. In *Eutriphora bermudensis* the shell is smaller and the brown colour extends further from the spiral nodules and the base is dark brown. In "*T. ellyae*" the white colour is limited to the upper spiral cord, the rest of the teleoconch including the central cord being brown. *Cheirodonta decollata* Rolán & Fernández-Garcés, 1994 is smaller, darker, and with a brown base.

*"Triphora" ellyae*

De Jong &amp; Coomans, 1988

Figs. 23, 24, 25

*Triphora ellyae* De Jong & Coomans, 1988. Marine gastropods from Curaçao, Aruba and Bonaire, p. 50, pl. 34, fig. 242.

**Material studied.** Curaçao and Aruba: Holotype, ZMA (n° 3.87.072). Northern Cuba: 3 shells at 15 m, La Habana; 2 shells at 4 m, Jibacoa. Southern Cuba: 1 shell at 56 m, Faro

de Los Colorados and 3 more at 42 m, in Punta Tamarindo, both in the Cienfuegos Bay.

**Description.** Shell (Fig. 23 & 24). Additions to that of DE JONG & COOMANS (1988): Aperture ovoid with two extensions, one the short, open siphonal canal, the other the anal sinus which is deep but always open. The brown colour is present on the protoconch and on the lower nodulose cord of the subsequent whorls, except on the first whorl of the teleoconch where it is faintly visible. The median cord in the final whorl is always brown, only the upper cord and its nodules being white. The base is brown.

Protoconch (Fig. 25) with 4 1/2 or occasionally five whorls, the first covered with minute hemispherical granules which resolve into axial ribs that are immediately crossed by two similar, spiral cords.

**Remarks.** Our shells (Fig. 24) are very similar to the holotype (Fig. 23).

The generic position of this species will be known when live material can be studied.

Other Caribbean triphorids in which the upper spiral cord is white are: "*T. elvirae*", which is more slender and has a white base; *Similiphora intermedia*, which has three nodular cords that start on the early teleoconch whorls, and the cords have contrasting colours. *Eutriphora bermudensis* has the central cord white on the final whorls and the first whorl of the teleoconch is also white, with the brown colour beginning on the second whorl. Moreover, *E. bermudensis* has a more solid shell, and a rounded aperture, while the anal sinus is almost fully tubular at the apertural border. *Iniforis turrithomae* and *I. pseudothomae* have the tubular anal hole located far from the aperture and have contrasting colors on the spiral cords.

**Genus *Eutriphora* Cotton & Godfrey, 1931**

Type species (Original designation): *Triphora cana* Verco, 1909; Recent, southern Australia.

*Eutriphora bermudensis* (Bartsch, 1911)

Figs. 26, 27, 28

*Triphoris bermudensis* Bartsch, 1911. Proc. U. S. Nat. Museum, 41, p. 305, pl. 28 figs. 2 and 4.

*Triphora turrissimilis*. Nowell-Usticke, 1971. A supplementary list of new shells, p. 8, pl. II, fig. 408.

**Material studied.** Northern Cuba: 1 shell at 10 m, Herradura; 1 shell in 4 m, Jibacoa; 2 shells at 4 m, Baracoa. Southern Cuba: 1 shell

at 42 m, Punta Tamarindo, 1 shell at 56 m, Faro de Los Colorados and 8 shells between 10-26 m, in the middle of the bay, Cienfuegos. Bahamas: 1 specimen at 11 m, Chub Rocks, Abaco I.

**Description.** Shell: see BARTSCH (1911). From this original description some details of the protoconch must be cited "...the second (whorl) marked by a raised spiral thread which is a little nearer the suture than the summit. On the third whorl a second spiral thread is present between the first and the summit". The biggest specimens are 6 mm and have 10 whorls on the teleoconch.

Protoconch (Fig. 27) with 5 whorls. Apex covered with minute hemispherical granules smaller beside the suture. Two subsequent whorls with axial riblets crossed by an well-defined spiral thread and a much weaker thread above. These threads are or equal size on the fourth whorl, but the upper one is vanished on the last whorl out and the single thread becoming very prominent.

Radula (Figs. 28 & 45 from the Bahamas specimen), with the formula 13-1-1-1-13. Central tooth with three equal cusps. Lateral tooth with 5 cusps, being a little bigger the central one. Marginals 1-4, with 4 similar cusps, of which those at the center are finer and longer. Marginals 5-13 with 3 cusps being the central cusp narrow and elongate.

**Remarks.** The generic assignment is based on the similarity of the radula, protoconch and shell to those of *Eutriphora armillata* (Verco, 1909) as described and illustrated by MARSHALL (1983).

Some characters mentioned by BARSTCH (1911) in the original description are incorrect: the first whorl of the apex is not smooth but instead tuberculate (Fig. 27), being smooth in beached shells. According to Barstch: "...The spiral cord at the summit is white while the supra-sutural and median cords are brown", but in fact, close examination of the two original figures shows that the median cord is white, as in our material (Fig. 26).

*E. bermudensis* can be differentiated from other Caribbean triphorids in which the upper spiral cord is white, as follows: *Cheirodonta decollata* is smaller, darker and usually decollated. *Iniforis turrithomae* and *I. pseudothomae* have the tubular anal hole placed far from the aperture. "*T. ellyae*" has smaller nodules, an ovoid aperture, the siphonal canal is open and the median spiral nodular cord is brown. "*T. elvirae*" is larger and narrower, the brown spiral cord is very narrow and the base is almost totally white.

### Genus *Latitriphora* Marshall, 1983

Type species (original designation): *Triphora latilirata* Verco, 1909; Recent, southern Australia.

#### *Latitriphora albida* (A. Adams, 1854)

Figs. 29, 30, 31, 32

*Triphoris albidus*. A. Adams, 1854 (1851). Proc. Zool. Soc. London, 19, p. 278.

*Triforis (Sychar) samanae*. Dall, 1889. Bulletin of the Museum of Comparative Zoölogy, 29, part II. p. 248.

*Triphora samanae* Dall, 1889. De Jong & Coomans, 1988, p. 51, pl. 34, fig. 245.

**Material studied.** Southern Cuba: 4 shells and 2 fragments from sediments between 10-25 m, Cienfuegos Bay. Bahamas: 1 specimen, under intertidal rocks, Rocky Point, Abaco Is.

**Description.** Shell (Fig. 29). See also DALL (1889) and DE JONG & COOMANS (1988). It is very characteristic in profile, coloration and nodules, which have an oblong form (Fig. 30).

Protoconch (Fig. 31) with 4 1/2 whorls. First whorl covered with minute hemispheric granules, that rapidly resolve into axial riblets mixed at the beginning with the granules. The second whorl shows only one spiral thread, there being two in the following.

Radula (Figs. 32 & 46 from the Bahamas specimen), with the formula 13-1-1-1-13. Central tooth with 3 similar cusps. Laterals with similar 5 cusps. Marginals 1-3 with 4 cusps, the 2 central ones filiform. From the marginal 4 there are only 3 cusps, the central longer, especially in the most external teeth.

Operculum paucispiral, with its spire of a quick increasing, translucent, without prominences.

**Remarks.** FABER & MOOLENBEEK (1991) included the present species in the genus *Latitriphora* apparently because of its similarity to the species included there by MARSHALL (1983). The radula of the present species is very similar to that of *Nototriphora aupouria* (Powell, 1937), but the shell is different. In any case, the radula of the type species of *Latitriphora* is unknown (MARSHALL, 1983), and so, we keep it provisionally in this genus.

There is no problem in separating the present species from the rest of the Caribbean triphorids, due to its elongated form and the very dense, axially elongated nodules.

**Genus *Aclophora* Laseron, 1958**

Type species (original designation): *Aclophora robusta* Laseron, 1958; Recent, Queensland, Australia.

***Aclophora sagei* n. sp.**

Figs. 33, 34, 35

**Material studied.** Southern Cuba: 6 shells and 3 fragments, between 20-56 m, Cienfuegos Bay (type locality).

**Type material.** Holotype of 8.6 mm in the MNCN n° 15.05/17223. One paratype in IES, AMNH 226500, ZMA, CFG and 4 in the CER.

**Description.** Shell (Fig. 33) sinistral, slender and elongated, sharp, with a rectilinear profile and almost all of brownish colour.

Protoconch (Fig. 35) brown, with 4 1/2 whorls. First whorl covered with minute hemispherical tubercles. Subsequent whorls with axial riblets and two median spiral threads.

Teleoconch with two nodulous spiral cords on the early whorls and which are increased to three by the apparition of an adapical cord very close to the suture on about the fourth whorl. Moreover, there is a finer spiral thread at the suture. Spiral cords are crossed by axial ribs, which are a little wider than the cords, numbering 18-22 per whorl. Rounded nodules at intersections. Last adult whorl with 4 nodulous cords, the lowest of which forms a peripheral angulation; there are two more not nodulous cords towards the base. Aperture rounded, outer lip protruding, undulating and a little everted. Posterior sinus deep, open, inner lip with a pronounced callus. Siphonal canal rendered tubular at aperture by enfolding of outer lip, though open as a slit below; curved towards the back and overlapping shell profile. First two teleoconch whorls white, subsequent whorls brown, darker at the suture and on the base.

**Etymology.** Named after Walter E. Sage of the AMNH for his continued help in our research.

**Remarks.** We have doubts about the generic classification of this species. The spiral sculpture is somewhat similar to that *Eutriphora cana* (Verco, 1909), the type species of the genus *Eutriphora*, while the aperture is similar to that *E. armillata* (Verco, 1909), both of which were treated by MARSHALL (1983). The aperture and siphonal canal are also similar to those of *Aclophora xystica* (Jousseume, 1884) and therefore we are keeping it provisionally in this last genus.

Several characters differentiate *A. sagei* n. sp. from the rest of the Caribbean species: its elongated and pointed form, the brown colour with the first whorls of the teleoconch white, the four spiral cords per whorl, the angulated periphery of the body whorl and the elongated siphonal canal.

***"Triphora" osclausum* n. sp.**

Figs. 36, 37, 38

**Material studied.** Northern Cuba: 6 shells and 4 fragments, at 6 m, Jibacoa (type locality); 2 shells and 1 fragment, at 2 m, Comodoro, La Habana. Southern Cuba: 2 shells, at 10 m, Cayo Diego Perez; 2 shells and 1 fragment, at 20 m, Cayo Matías, Archipiélago de los Canarreos; 2 shells, at 20 m, Cienfuegos Bay.

**Type material.** Holotype (Fig. 36) of 4.5 mm in the MNCN n° 15.05/17224. One paratype in each collection of the following: IES, AMNH 226501, BMNH, ZMA, CFG, and 3 in the CER.

**Description.** Shell (Fig. 36 & 37) sinistral, ovoid elongated, sharp, with a slight curvilinear profile, uniform light brown.

Protoconch (Fig. 38) with about 4 whorls. First whorl covered by minute hemispherical granules, subsequent whorls with two similar spiral cords crossed by axial ribs.

Teleoconch initially with two nodulous spiral cords; another cord appearing about the fourth whorl, in the interspaces on, gradually enlarging to resembling adjacent spirals, and three or four whorls later the three cords are of equal size. These cords are crossed by axial ribs which are as wide as the cords, forming nodules at the points of intersections. Axial ribs 14-17 numbering on earlier whorls, 18-24 on later whorls. Last adult whorl with four nodulous cords, and two smoother ones on base. Aperture rounded, the outer lip prominent and spoon-like, not everted. Posterior notch deep, open. Inner lip with a slight callus. Siphonal canal enclosed at the aperture by a fold of the outer lip, short, curved towards the dorsum.

**Etymology.** The specific name is derived from the two Latin words *os* (mouth) and *clausum* (closed), because its aperture is a close circle.

**Remarks.** Comparison must be made with other triphorids of uniform brown colour, with which it was previously confused. *Marshallora modesta* can be differentiated by its overall darker colour, darker suture, more ovoid aperture, and outer lip with light cream border. Moreover, the siphonal canal in *M. modesta* is

shorter and not enclosed, and the anal sinus is shallower. The siphonal canal in *Marshallora nigrocincta* is not enclosed either (CLENCH & TURNER, 1959, pl. 38, figs. 11 & 14). Other Caribbean species with brown shells, such as *Cheirodonta apexcrassum* Rolán & Fernández-Garcés, 1984, *Isotriphora peetersae* (Moolenbeek & Faber, 1989) and "*Triphora*" *calva* Faber & Moolenbeek, 1991 have paucispiral protoconchs, while in *Mesophora novem* (Nowell-Usticke, 1969) and *Cheirodonta verbernei* (Moolenbeek & Faber, 1989), the first teleoconch whorls are white.

**"*Triphora*" *martii* n. sp.**

Figs. 39, 40, 41, 42

**Material studied.** Southern Cuba: 9 shells (some broken) and 1 fragment, at 20-40 m, Cienfuegos Bay (type locality).

**Type material.** Holotype (Figs. 39, 40 & 41) of 4.5 mm in the MNCN n° 15.05/17225. One paratype in AMNH 226502, IES, CFG, and 6 in CER.

**Description.** Shell (Fig. 39, 40 & 41) sinistral, ovoid elongated, sharp, rather wide in last whorls.

Protoconch (Fig. 42) with about 4 1/2 whorls. First whorl covered by minute hemispherical granules. Subsequent whorls have two spiral threads crossed by axial ribs.

Teleoconch with two spiral nodulous cords on all whorls. The upper cord close beside suture, separated from it by a small thread which is located very close to the cord. On the penultimate whorl an additional small cord appears below the adapical one, enlarging but never reaching the size of the cord above. The nodules are bigger on the upper cord, conneted to those on the lower cord by a few oblique ribs. The axial ribs almost disappear at base, where the width of the shell decreases, protruding the border of the aperture and the siphonal canal. Aperture rounded, with a deep sinus at the top of the aperture which is almost closed by a fold. Siphonal canal small, strongly curved towards dorsum, open, and crossed by a prolongation of the outer lip. Protoconch brown; teleoconch white, with a dark brown spiral line on the lower cord. That vanishes near apertura rim. Below this is another white spiral cord, and below still there is a additional finer brown line.

**Etymology.** It is named in honour of the hero of the Cuban struggle for independence José Martí.

**Remarks.** This species must be differentiated from other banded triphorids on which the dark coloration is only present in a spiral line: *Iniforis turrithomae* and *I. pseudothomae* have a dark base that lacks the second brown line, with the anal sinus developing into a tube at some distance from the border of the lip. *I. carmelae* Rolán & Fernández-Garcés, 1993 has a paucispiral protoconch. "*Triphora*" *elvirae* has an elongated form, the third spiral cord appears before the penultimate whorl and, when a second brown line is present, it is immediately adjacent to the first one, without the intermediate white cord. "*T.*" *ellyae* and *Eutriphora bermudensis* have dark bases and very different apertures.

**Acknowledgements.**

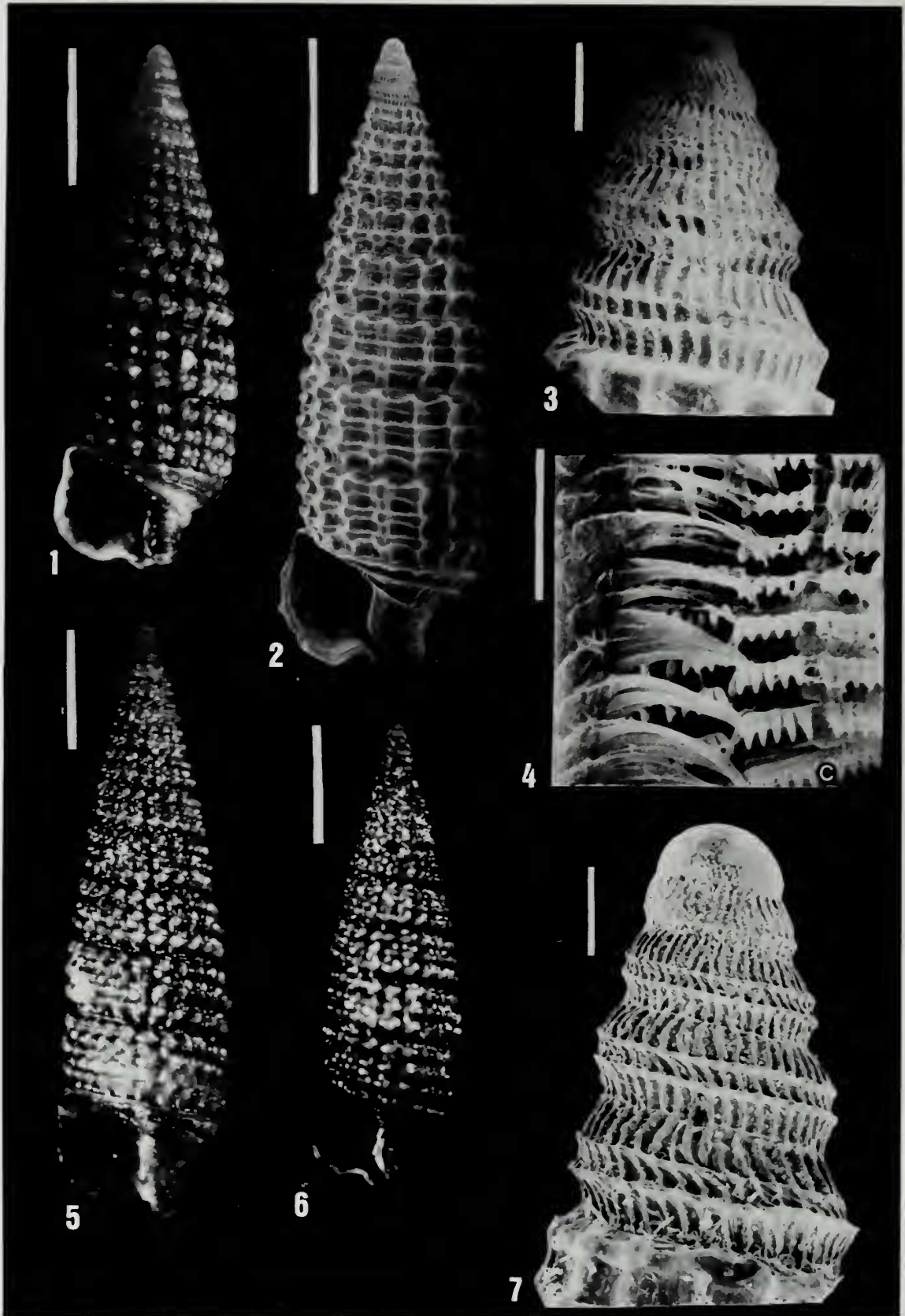
We are indebted to Walter E. Sage of the AMNH for his help in sending type material and his help with the bibliography; to the Mollusks Depart. of the MCZ for help in sending type material, to José Templado of the MNCN for contributions to the bibliography; to Armando Priegue and Enrique Porto of the Asociación de Investigación Metalúrgica del Noroeste (AIMEN) for the SEM photography; to Colin Redfern for his help loaning material from Bahamas for comparative study and reading the manuscript; to Kevin Pumpley for his corrections to the English; to referees for their help.

**REFERENCES**

- ABBOTT, R. T. 1974. *American seashells*. (2nd. Ed.). Van Nostrand Reinhold Co. New York. 663 pp., 24 pls.
- ADAMS, C. B. 1850. Description of supposed new species of marine shells which inhabit Jamaica. *Contributions to Conchology* (4): 56-68.
- BARTSCH, P. 1911. New marine mollusks from Bermuda. *Proceeding United States Natural Museum*, 41: 303-306, pl. 28.
- BOUCHET, P. 1984. Les Triphoridae de Méditerranée et du proche Atlantique (Mollusca, Gastropoda). *Lavori S. I. M.*, 21: 5-58.

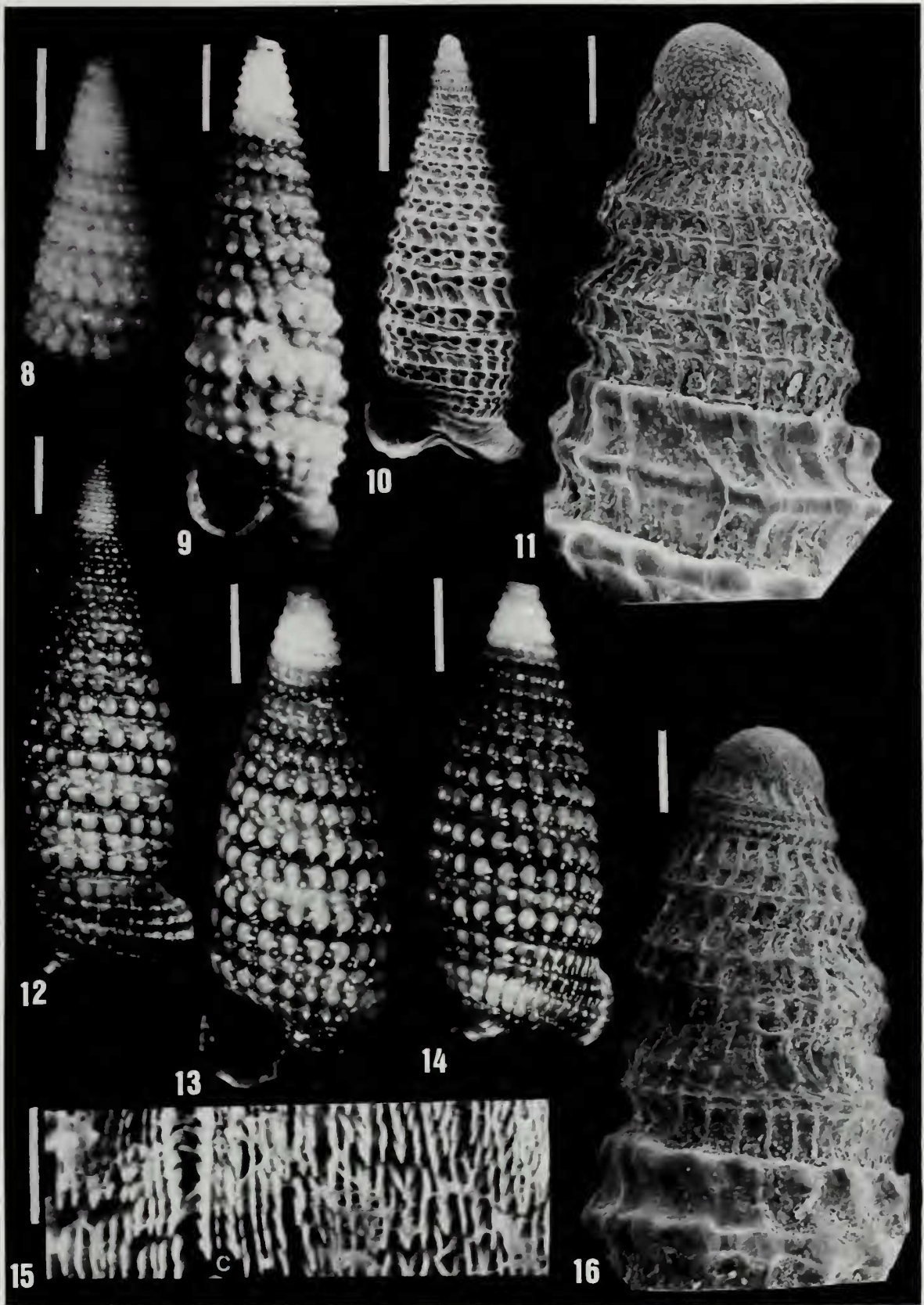


- CLENCH, W. J. & R. D. TURNER, 1950. The Western Atlantic marine mollusks described by C. B. Adams. *Occasional Papers on Mollusks*, 1 (15): 233-403.
- DALL, W. H. 1889. [Reports on the results... in the Gulf of Mexico... by the U. S. Coast Survey steamer "Blake"...] XXIV. Report on the Mollusca. Part II. Gastropoda & Scaphopoda. *Bulletin of the Museum of Comparative Zoölogy*, 18: 1-492, pls. 40.
- DE JONG, K. M. & H. E. COOMANS, 1988. *Marine gastropods from Curaçao, Aruba and Bonaire*. E. J. Brill. Leiden. 261 pp.
- FABER, M. J. & R. G. MOOLENBEEK, 1991. Two new shallow water triphorids and a new name in *Metaxia* from Florida and the West Indies. *Apex*, 6 (3-4): 81-85.
- FERNANDES, F. & E. ROLÁN, 1986. A Família Triphoridae (Mollusca: Gastropoda) no Archipélago de Cabo Verde. *Publicaciones Ocasionalis Sociedade Portuguesa de Malacologia*. (11): 17-32.
- GARCIA, M. T. & A. A. LUQUE, 1986. Contribución al conocimiento de los gasterópodos prosobranquios de la Isla de la Juventud y del Archipiélago de los Canarros (Cuba). *Revista de Investigaciones Marinas*, 7 (29): 31-52.
- MARSHALL, B. A. 1983. Triphoridae of Southern Australia. *Records of the Australian Museum*, suppl. 2: 1-119.
- MOOLENBEEK, R. G. & M. J. FABER, 1989. Two new *Triphora* species from the West Indies (Gastropoda: Triphoridae). *Basteria*, 53 (4-6): 77-80.
- NOWELL-USTICKE, G. W. 1971. *A supplementary listing of new shells*. Private edition. U. S. A. 31 pp.
- PILSBRY, H. A. & C. G. AGUAYO, 1933. Marine and fresh water molluscs new to the fauna of Cuba. *Nautilus*, 46: 116-123
- ROLÁN, E. & J. ESPINOSA, 1994. The family Triphoridae (Mollusca, Gastropoda) in Cuba 3. The genus *Isotriphora*. *Basteria* 58(1-2): 63-68.
- ROLÁN, E. & R. FERNÁNDEZ-GARCÉS, 1993a. La familia Triphoridae en la isla de Cuba 1. El género *Metaxia* Monterosato, 1884. *Bollettino Malacologico*, 28 (6-12): 169-176.
- ROLÁN, E. & R. FERNÁNDEZ-GARCÉS, 1993b. The family Triphoridae (Mollusca, Gastropoda) in Cuba 2. The genus *Iniforis* Jousseaume, 1884. *Apex*, 8 (3): 95-106.
- ROLÁN, E. & R. FERNÁNDEZ-GARCÉS, 1994. The family Triphoridae (Mollusca, Gastropoda) in Cuba 4. The genera *Monophorus*, *Nototriphora*, *Cosmotriphora* and *Cheirodonta* with the description of three new species. *Apex*, 9 (1): 17-27.
- THIRIOT-QUIEVREUX, C. & R. S. SCHELTEMA, 1982. Planktonic larvae of New England gastropods v. *Bittium alternatum*, *Triphora nigrocincta*, *Cerithiopsis emersoni*, *Lunatia heros* and *Crepidula plana*. *Malacologia*, 23 (1): 37-46.
- WARMKE, G. L. & R. T. ABBOTT, 1961. *Caribbean seashells*. Livingston Publishing Co. Wynnewood, Pennsylvania. 348 pp., 43 pls.



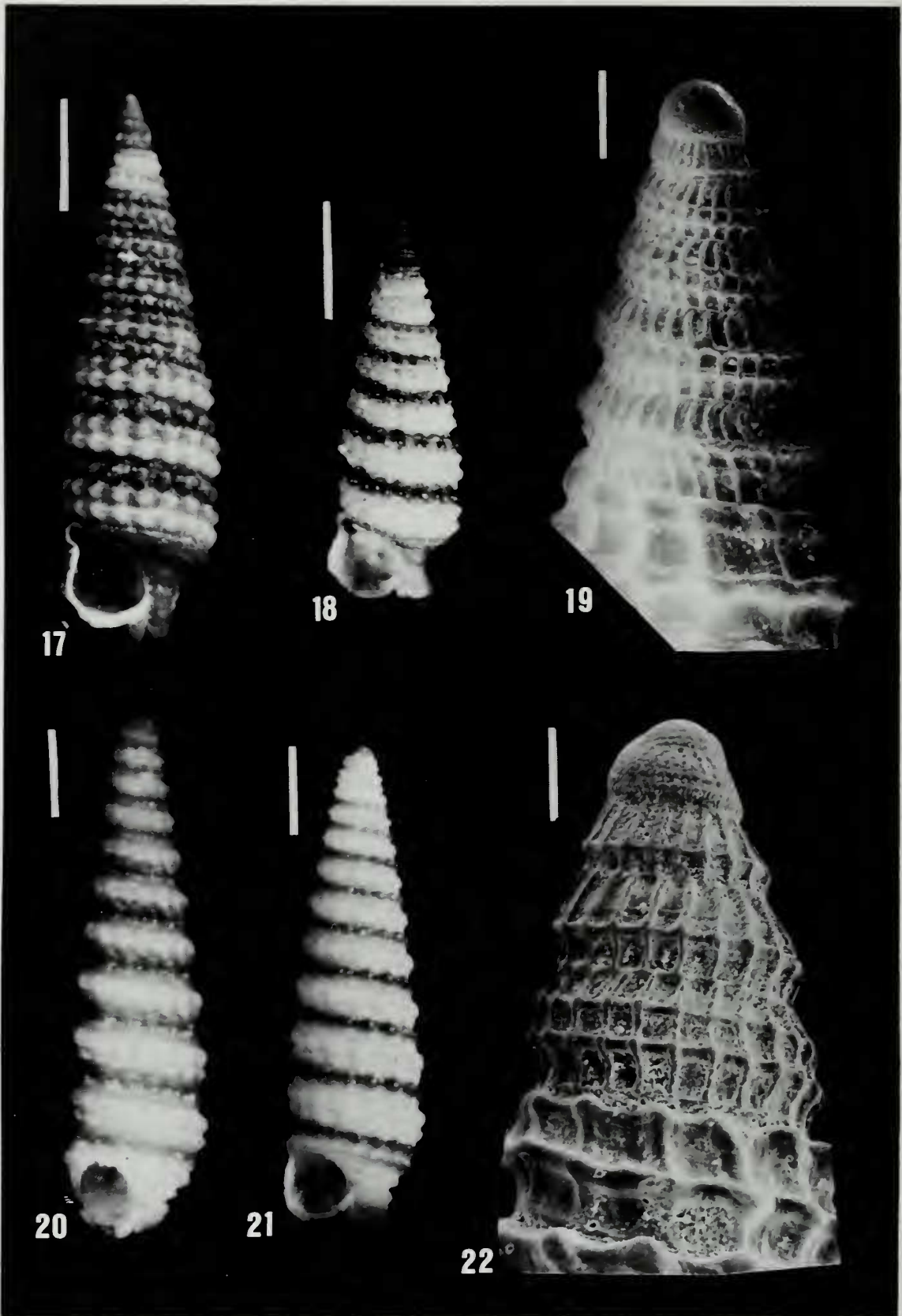
Figs. 1-7.

1-2.- *Marshallora modesta*; 3.- *M. modesta* (protoconch); 4.- *M. modesta* (radula); 5-6.- *M. cf. nigrocincta*; 7.- *M. cf. nigrocincta* (protoconch). (scale bar: shells = 1 mm; protoconchs = 0.1 mm; radulae 0.01 mm)



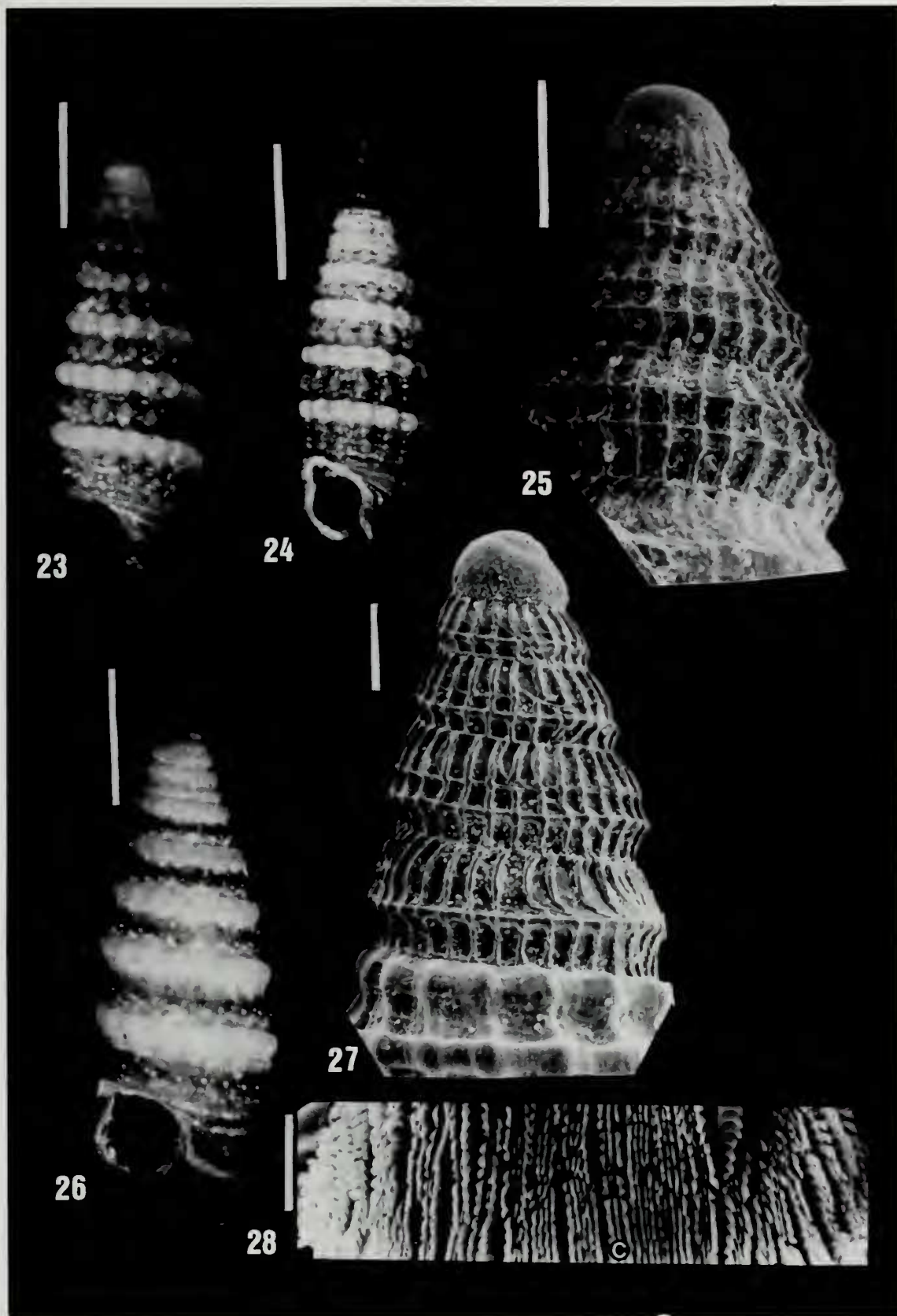
Figs. 8-16.

8.- *Mesophora novem*. Holotype (AMNH), 9-10.- *M. novem*; 11.- *M. novem* (protoconch); 12-14.- *M. aff. novem*; 15.- *M. aff. novem* (radula); 16.- *M. aff. novem* (protoconch).  
 (scale bar: shells = 1 mm; protoconchs = 0.1 mm; radulae 0.01 mm)



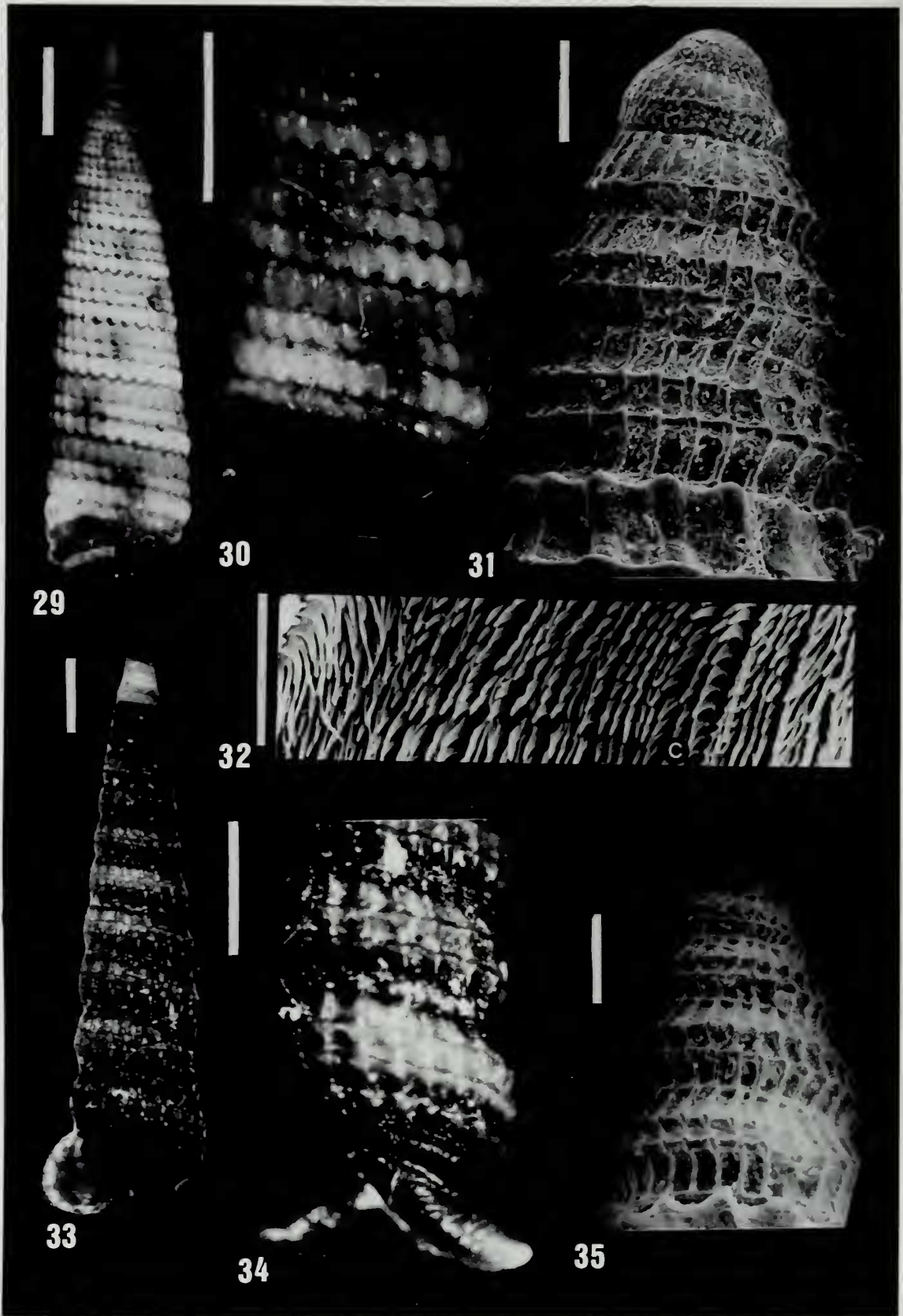
Figs. 17-22.

17-18.- *Similiphora intermedia*; 19.- *S. intermedia*. (protoconch); 20.- "*Triphora*" *elvirae* Holotype (ZMA); 21.- "*T.*" *elvirae*.; 22.- "*T.*" *elvirae* (protoconch). (scale bar: shells = 1 mm; protoconchs = 0.1 mm)



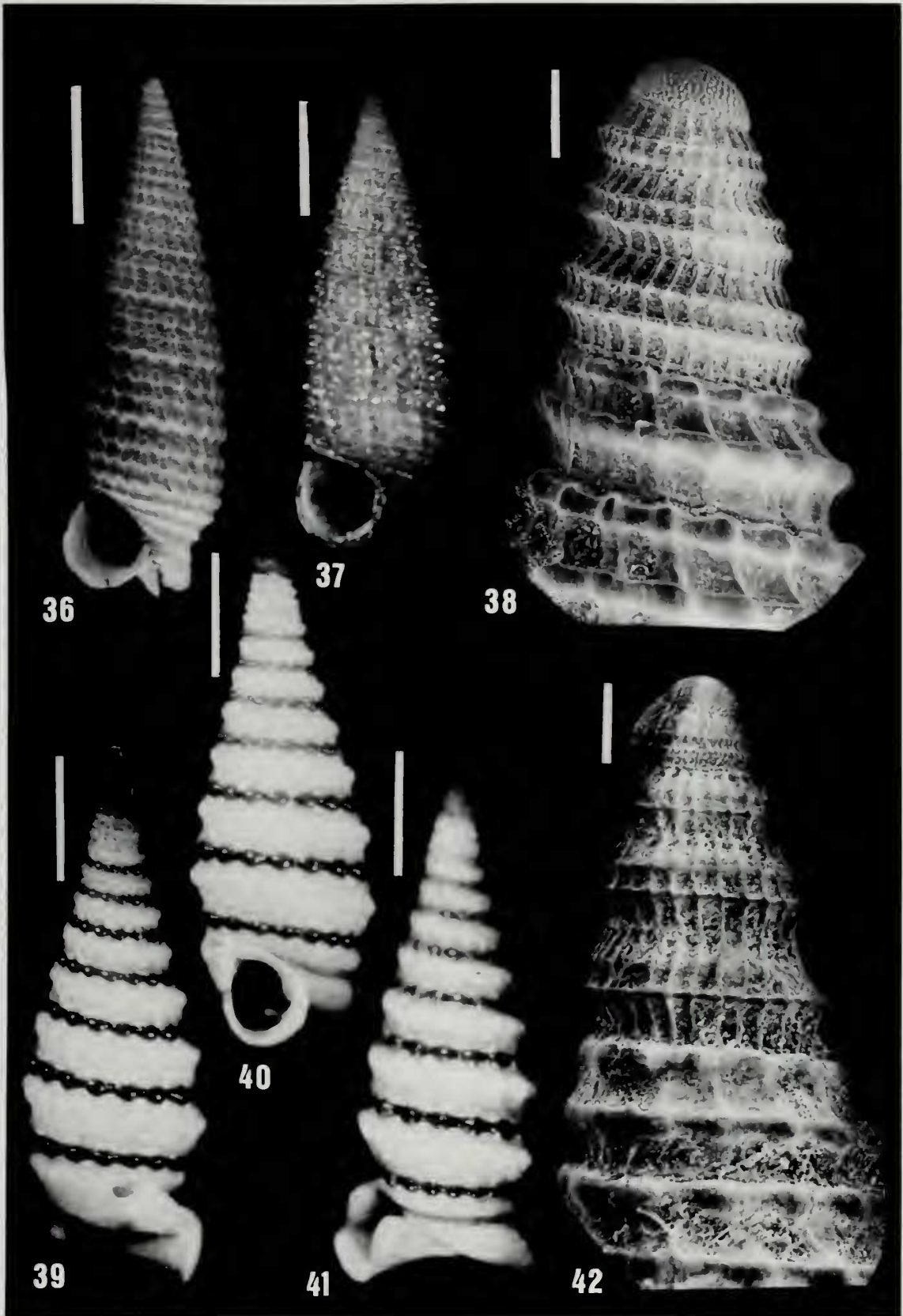
Figs. 23-28.-

23.- *"Triphora" ellyae*. Holotype (ZMA); 24.- *"T." ellyae*; 25.- *"T." ellyae* (protoconch); 26.- *Eutriphora bermudensis*; 27.- *E. bermudensis*. (protoconch); 28.- *E. bermudensis* (radula). (scale bar: shells = 1 mm; protoconchs = 0.1 mm; radulae 0.01 mm)



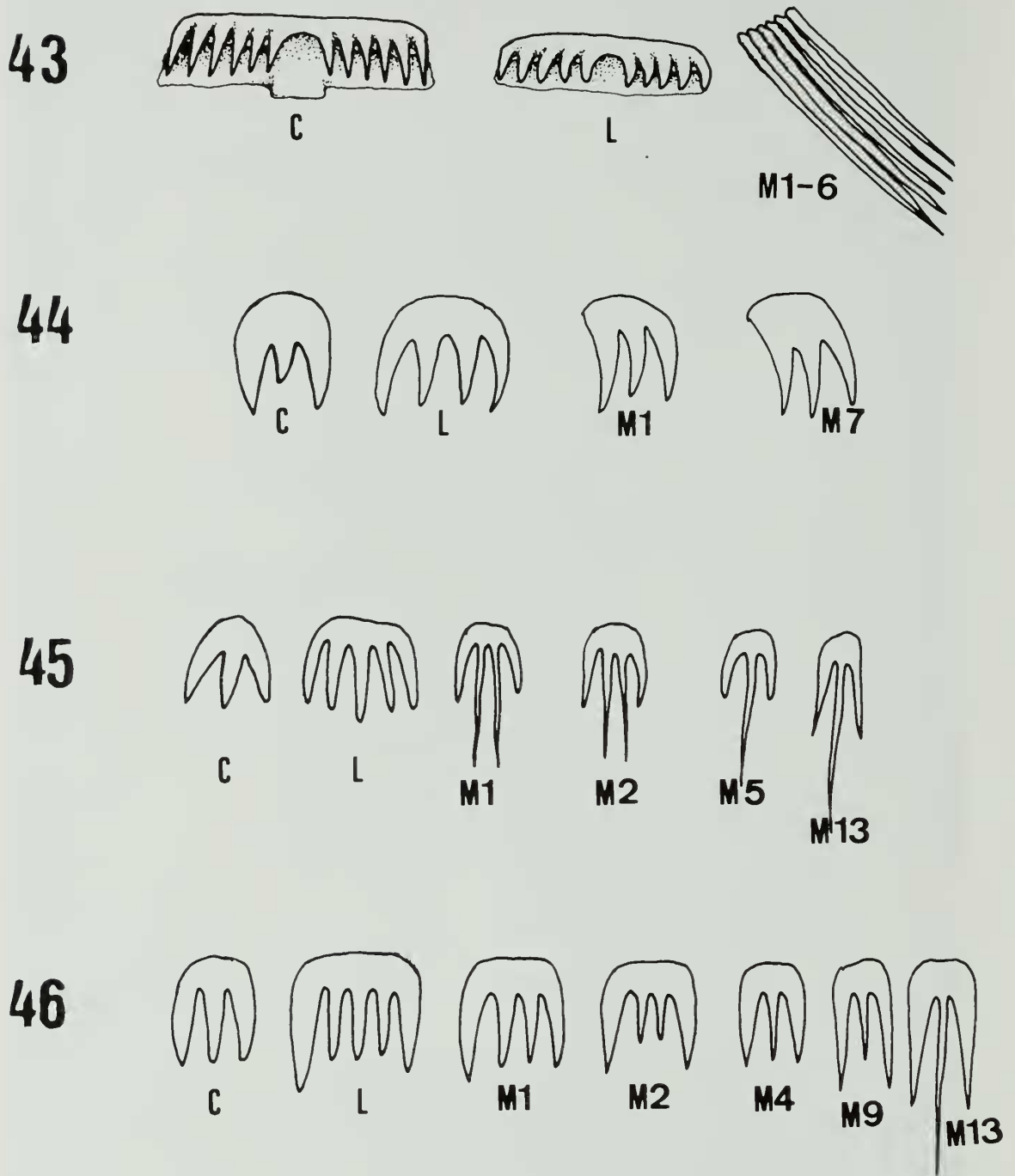
Figs. 29-35.

29-30.- *Latitriphora albida*; 31.- *L. albida* (protoconch); 32.- *L. albida* (radula); 33.- *Aclophora sagei* n. sp. Holotype (MNCN); 34.- *A. sagei* n. sp. Holotype. Detail; 35.- *Aclophora sagei* n. sp. (protoconch). (scale bar: shells = 1 mm; protoconchs = 0.1 mm; radulae 0.01 mm)



Figs. 36 -42.

36.- "*Triphora*" *osclausum* n. sp. Holotype (MNCN); 37.- "*T.*" *osclausum* n. sp.; 38.- "*T.*" *osclausum* n. sp. (protoconch); 39-41.- "*Triphora*" *martii* n. sp. Holotype (MNCN); 42.- "*T.*" *martii* n. sp. (protoconch). (scale bar: shells = 1 mm; protoconchs = 0.1 mm)



Figs. 43-46.

43.- Radula of *Marshallora modesta*; 44.- Radula of *Mesophora* aff. *novem*; 45.- Radula of *Eutriphora bermudensis*; 46.- Radula of *Latitriphora albida*. (C- central tooth; L- lateral tooth; M- marginal teeth)